The genomic stability of induced pluripotent stem cells.

Journal: Protein Cell

Publication Year: 2012

Authors: Zhao Chen, Tongbiao Zhao, Yang Xu

PubMed link: 22528751

Funding Grants: Developing induced pluripotent stem cells into human therapeutics and disease models

Public Summary:
In this review, we summarize the issue of genomic instability of iPSCs.

Scientific Abstract:
With their capability to undergo unlimited self-renewal and to differentiate into all cell types in the body, induced pluripotent stem cells (iPSCs), reprogrammed from somatic cells of human patients with defined factors, hold promise for regenerative medicine because they can provide a renewable source of autologous cells for cell therapy without the concern for immune rejection. In addition, iPSCs provide a unique opportunity to model human diseases with complex genetic traits, and a panel of human diseases have been successfully modeled in vitro by patient-specific iPSCs. Despite these progresses, recent studies have raised the concern for genetic and epigenetic abnormalities of iPSCs that could contribute to the immunogenicity of some cells differentiated from iPSCs. The oncogenic potential of iPSCs is further underscored by the findings that the critical tumor suppressor p53, known as the guardian of the genome, suppresses induced pluripotency. Therefore, the clinic application of iPSCs will require the optimization of the reprogramming technology to minimize the genetic and epigenetic abnormalities associated with induced pluripotency.